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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/047,008

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Yoshitada Katagiri

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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,008

Applicant(s)

KATAGIRI ET AL.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
4a) Of the above claim(s) 1-7, 16-19, 24, 25, 27, 28 and 30 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 8-15, 20-23, 26 and 29 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/2/05.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 1-7, 16-19, and 24-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected species or subspecies, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 1/18/05. Contrary to the applicant's assertions, claims 16-19 fail to read on the elected species/subspecies. These claims are drawn to the free-space ring lasers not elected. Furthermore, claim 26 has been examined being that it forms the basis for claim 29 the species of which was elected by the applicant.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8-9 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (U.S. Patent No. 5,524,118).

Regarding claim 8, Kim teaches a laser oscillator (Figure 3) which outputs laser light oscillated simultaneously at a plurality of wavelengths (e.g. λ_1 - λ_n in Figure 3), the total number of generated photons being constant.

Regarding claim 9, Kim teaches an optical negative feedback element (e.g. left branch of loop in Figure 3); and a plurality of band pass filters (reference letters TF in Figure 3) which are connected to the optical negative feedback element and have different transmission center

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wavelengths, wherein single peak modes matching the transmission center wavelengths of the band pass filters being oscillated simultaneously, the statistical distribution of photons in each mode complying with thermal distribution, and the total number of photons of the sum of the plurality of modes being constant.

Regarding claim 11, Kim teaches a divider (e.g. 1XN in Figure 3) which divides the optical path of the ring resonator into a plurality of branches at a predetermined location, and outputs the divided light to the band pass filters (reference letters TF in Figure 3); and a coupler (e.g. 1XN in Figure 3) which multiplexes transmitted light from the band pass filters, and couples the multiplexed light to one optical fiber; and wherein the laser oscillator simultaneously oscillating laser light in a plurality of different wavelength modes within the ring resonator (e.g. λ_1 - λ_n in Figure 3).

Regarding claim 12, Kim teaches a plurality of variable optical attenuators (e.g. ATN in Figure 3), which are provided at each branch and attenuate light, transmitted along each branch; and a control circuit which adjusts the variable optical attenuators so as to equalize the optical strengths of transmission center wavelengths of each band pass filter (e.g. inherent in the attenuators ability to “regulate” as discussed in column 3 lines 1-9).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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5. Claims 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Frankel (U.S. Patent No. 6,430,336).

Regarding claim 20, Frankel teaches a plurality of laser oscillators (reference numeral 116-1 in Figure 1) which output laser light oscillated simultaneously at a plurality of wavelengths (e.g. λ_1 - λ_N in Figure 1), the total number of generated photons being constant; a plurality of optical modulators (reference numeral 118 in Figure 1) which add identical data to the laser light, output by the plurality of laser oscillators, and output optical signals; and a coupler (reference numeral 124 in Figure 1) which multiplexes the plurality of optical signals, output by the plurality of optical modulators, and transmits a wavelength-multiplexed signal.

Regarding claim 21 Frankel teaches a separator (reference numeral 122 in Figure 1) which separates wavelength components, comprising the wavelength-multiplexed signals output by the coupler, so that a plurality of wavelengths, oscillated simultaneously by each individual laser oscillator, all belong to different wavelength groups (e.g. ODD/EVEN in Figure 1); and a plurality of couplers (reference numeral 124, 126, 132 in Figure 1) which generate a plurality of wavelength-multiplexed signals by multiplexing light from each of the wavelength groups, and transmit the multiplexed light to transmission paths corresponding to the wavelength-multiplexed signals.

Regarding claim 22, Frankel teaches a separator (reference numeral 134 in Figure 1) which separates wavelength components, comprising the wavelength-multiplexed signals output by the coupler, so that a plurality of wavelengths, oscillated simultaneously by each individual laser oscillator, all belong to different wavelength groups (e.g. ODD/EVEN in Figure 1); and a plurality of couplers (reference numeral 124, 126, 132 in Figure 1) which generate a plurality of

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wavelength-multiplexed signals by multiplexing light from each of the wavelength groups, and transmit the multiplexed light to transmission paths corresponding to the wavelength-multiplexed signals.

Regarding claim 23, Frankel teaches that the optical signals are transmitted on different transmission paths for each of the plurality of wavelength groups (e.g. ODD path, EVEN path in Figure 1), so that a plurality of simultaneously oscillated wavelengths all belong to different wavelength groups (e.g. ODD path, EVEN path in Figure 1), and further comprising a coupler (reference numeral 134 in Figure 1) which multiplexes the optical signals, transmitted along the transmission paths, and outputs to the selectors.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim.

Regarding claim 10, Kim differs from the claimed invention in that Kim fails to specifically teach that the negative feedback element comprising a semiconductor light amplifier having gain saturation characteristics. However, semiconductor light amplifiers are very well known in the art and Official Notice of semiconductor light amplifiers is taken. One skilled in the art would have been motivated to employ semiconductor light amplifiers rather than the EDF amplifiers taught by Kim since semiconductor light amplifiers are less expensive and more

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readily available than EDF amplifiers. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ semiconductor light amplifiers in the device of Kim.

Regarding claims 13 and 15, Kim differs from the claimed invention in that Kim fails to specifically teach a polarization controller, which aligns the polarization planes of the branches by adjusting the polarization planes of each branch, is provided in the ring resonator. However, the use of polarization controller in ring oscillators such as that taught by Kim is well known in the art. In fact, Kim discloses that they are well known in the art (Figure 1A). One skilled in the art would have been motivated to employ polarization controllers in the device of Kim in order to control the polarization of each individual wavelength created by the ring laser. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include polarization controllers in the device of Kim.

Regarding claim 14, Kim differs from the claimed invention in that Kim fails to specifically teach that the optical fibers, which form the ring resonator, comprise polarization-maintaining fibers, the polarization state of the polarization-maintaining fibers being adjusted so as to maximize the optical output of the laser resonator. However, the use of polarization maintaining fibers in the art of optical communication is very well known in the art and Official Notice of polarization maintaining fibers is taken. One skilled in the art would have been motivated to employ polarization maintaining fibers in the device of Kim in order to control the polarization of the optical signals throughout the ring laser. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ polarization maintaining fibers in the device of Kim.

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8. Claims 26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frankel in view of Kim.

Regarding claim 26, Frankel teaches a transmitter (reference numeral 116 in Figure 1) which generates laser light by using a laser resonator, which generates photons by stimulated emission centering on a plurality of windows, provided on a wavelength axis, and using an optical modulator (reference numeral 118 in Figure 1) to add data to the laser light and transmit a signal light; a transmission path which the signal light, transmitted from the transmitter, is transmitted along (reference numeral 114 in Figure 1); and a receiver (reference numeral 112 in Figure 1) which receives the signal light from the transmission path, and demodulates (reference numeral 140 in Figure 1) the data based on an optical signal having wavelength components corresponding to the plurality of windows contained in the signal light. Frankel differs from the claimed invention in that Frankel fails to specifically teach that the transmitter comprises an optical negative feedback element for keeping the total number of generated photons constant. However, as discussed in the rejection of claims 8-15, Kim teaches that this type of transmitter is well known in the art. One skilled in the art would have been motivated to employ a transmitter such as that taught by Kim in the device of Frankel since such transmitter provide a higher serviceable value (column 2 lines 1-8 of Kim). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a transmitter which comprises a negative feedback element as taught by Kim in the device of Frankel.

Regarding claim 29, the combination of references differs from the claimed invention in that it fails to specifically teach the ring network as claimed. However, forming ring networks by connecting a plurality of nodes as claimed is very well known in the art of optical

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communications and Official Notice is taken that these types of networks are well known in the art. One skilled in the art would have been motivated to form a ring network in order to allow the transmission of information between a plurality of customers. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to form a ring network from the devices taught by the combination of references.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB


AGUSTIN BELLO
PATENT EXAMINER